

WE CLAIM:

1 1. A spatial light modulator, comprising:
2 memory elements configured to store data therein and shift data therebetween;
3 and
4 light modulation elements alterable in response to the data stored in respective
5 ones of the memory elements.

1 2. The spatial light modulator according to claim 1, wherein said memory
2 elements are arranged in an array having rows and columns.

1 3. The spatial light modulator according to claim 2, wherein said memory
2 elements are configured to shift the data bi-directionally between rows.

1 4. The spatial light modulator according to claim 2, wherein said memory
2 elements are configured to shift the data bi-directionally between columns.

1 5. The spatial light modulator according to claim 2, wherein said memory
2 elements are configured to shift the data bi-directionally between at least one of non-adjacent
3 rows and non-adjacent columns.

1 6. The spatial light modulator according to claim 1, wherein said memory
2 elements are arranged in a nonorthogonal pattern.

1 7. The spatial light modulator according to claim 1, wherein said memory
2 elements are static memory elements.

1 8. The spatial light modulator according to claim 7, wherein each of the memory
2 elements includes a feedback element.

1 9. The spatial light modulator according to claim 8, wherein the feedback
2 element is a weak feedback element.

1 10. The spatial light modulator according to claim 1, further comprising access
2 control elements connected to said respective memory elements.

1 11. The spatial light modulator according to claim 10, wherein said access control
2 elements include a forward access control element operable to control the state of said
3 respective memory element during a forward shift operation and a reverse access control
4 element operable to control the state of said respective memory element during a reverse shift
5 operation.

1 12. The spatial light modulator according to claim 1, wherein each of said
2 memory elements further includes an output node electrically coupled to an electrode of said
3 respective light modulation element and to an input node of an additional one of said memory
4 elements.

1 13. The spatial light modulator according to claim 12, wherein said memory
2 elements are interconnected in a shift register configuration.

1 14. The spatial light modulator according to claim 13, wherein said memory
2 elements each include a master-slave flip-flop.

1 15. The spatial light modulator according to claim 13, further comprising:
2 a timing circuit in communication with each of said memory elements to shift
3 the data between said memory elements.

1 16. The spatial light modulator according to claim 15, wherein said timing circuit
2 comprises a ripple clock.

1 17. The spatial light modulator according to claim 15, wherein said light
2 modulation elements comprise liquid crystal material.

1 18. The spatial light modulator according to claim 17, wherein said light
2 modulation elements further comprise:
3 a common electrode configured to receive a common electrode signal for said
4 light modulation elements; and
5 a respective pixel electrode configured to receive the data stored in said
6 respective memory elements.

1 19. The spatial light modulator according to claim 18, wherein said timing circuit
2 is operable to shift inverted data from a first one to a second one of the memory elements and
3 to switch the common electrode signal to alter the light modulation element associated with
4 the second one of the memory elements as a function of the inverted data.

1 20. The spatial light modulator according to claim 1, wherein said light
2 modulation elements comprise micromirrors.

1 21. The spatial light modulator according to claim 1, wherein said memory
2 elements are arranged in blocks, a first one of said blocks configured to receive data from an
3 external input and the others of said blocks configured to receive data from other ones of said
4 memory elements.

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1 22. A method for performing photolithography, said method comprising:
2 loading data representing an image into memory elements in communication
3 with respective light modulation elements;
4 altering ones of the light modulation elements in response to the data loaded
5 thereunto to transfer the image onto a substrate;
6 shifting the data between the memory elements;
7 altering ones of the light modulation elements in response to the data shifted
8 thereunto to transfer the image onto the substrate.

1 23. The method according to claim 22, wherein each said altering further
2 comprises:
3 applying a voltage in response to the data to the change optical characteristics
4 of the light modulation elements.

1 24. The method according to claim 22, wherein said shifting further comprises:
2 utilizing a ripple clock to control the timing of said shifting.

1 25. The method according to claim 22, further comprising:
2 moving at least one of the substrate and the light modulation elements relative
3 to the other.

1 26. The method according to claim 25, wherein said altering in response to the
2 shifted data is performed after said moving.